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Abstracts

High Density Lidar Data for Regional Sediment Management

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Assessing the performance of coastal projects requires determining how all the elements interact to define the behavior of the entire system. Recent technologies such as airborne lidar provide the ability to collect coastal survey data on a regional level, demonstrating a systems approach to sediment management in the coastal region. Since becoming available, Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) (where Lidar means Light Detection and Ranging) has performed numerous coastal surveys which demonstrate the concept of this new technology towards regionalized sediment management. Recognizing the need for regional sediment management, the State of Florida and the U.S. Army Corps of Engineers have embarked on adopting a systems approach toward regional sediment management. The study will have SHOALS survey portions of 217 km of shoreline in Florida and 48 km in Alabama, including eight State parks, the Gulf Islands National Seashore, and Eglin and Tyndall Air Force Bases, five Federal navigation projects, and a 27-km-long, 5.7-million-cu-m Federal beach erosion control and storm damage reduction project.

Fire Island to Montauk Point, New York, Regional Sediment Budget

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The 133-km barrier island chain extending east from Fire Island Inlet to Montauk Point, New York, provides an excellent setting for evaluating sand management practices which have had a significant impact on the local (order of 1 to 2 km) and regional (133 km) sediment budget. Through the development of a regional sediment budget representative of 1979 to 1995, sediment transport pathways and magnitudes are estimated. Evaluation of the sediment budget in context with sand management during this period highlights those practices that have been influential in the evolution of the barrier island and inlet system. The regional sediment budget provides estimates of net longshore sediment transport (LST) rates, engineering activities (beach fill placement and dredging), and sources and sinks representative of the Fire Island to Montauk Point study area. These sediment budgets fall within accepted ranges of net LST rates as derived by previous researchers. Beach fill placement and/or transfer of littoral material to adjacent beaches is an important mechanism in maintaining the study area beaches. The majority of the beach fill placement most likely occurs through dredging of the inlets and bays, and placement on the adjacent beaches. It was concluded that a source of sediment offshore of central Fire Island may exist, although the forcing mechanism is unknown.

Seaward Limit of Significant Net Sediment Transport Evaluated by Sonar Altimetry

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The seaward limit of significant net sediment transport, or the depth of closure (D_c), has traditionally been estimated by comparing beach profiles to determine where negligible vertical change has occurred. Downward-looking sonar altimeters at three depths (5.5, 8, and 13 m) were deployed at the U.S. Army Engineer Research and Development Center's Field Research Facility, Duck, North Carolina, to evaluate survey data used to calculate event-dependent D_c and to extend observations to 13-m depths on an oceanic wave-dominated beach. Sonar data were compared with survey data of August to December 1995. Surveyed profile data and sonar altimetry measurements of seabed elevations were within 8 ± 4 cm at 5.5- and 8-m depths. Continuous sonar altimeter measurements were collected during storm events and span a 40-cm range of seabed elevations in 5.5-, 8-, and 13-m water depths. Biweekly and post-storm profiles recorded a range of only 25 ± 6 cm at 5.5-m depth and 10 ± 6 cm at 8-m depth. During Hurricane Felix, sediments were deposited in 13-m depths during onshore flows, indicating a shoreward flux of sediment. Sediment budgets must account for additional cross-shore fluxes of sediment beyond D_c.

This and all future issues of the CERCular will present brief abstracts with the complete text on the Internet at http://bigfoot.wes.army.mil/C130.html or through the "News" section of the Coastal and Hydraulics Laboratory homepage at http://chl.wes.army.mil. Paper copies will no longer be distributed.

US Army Corps of Engineers
Engineer Research and Development Center

The Corps' Coastal Vision Statement

We will, as the National Coastal Engineer:

- ***Continue our leadership in the protection, optimization, and enhancement of the Nation's coastal zone resources.***
- ***Increase our contribution to the Nation's economy, quality of life, public safety, and environmental stewardship.***

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Contributions of pertinent information are solicited from all sources and will be considered for publication. Communications are welcomed and should be addressed to the U.S. Army Engineer Research and Development Center, Coastal and Hydraulics Laboratory, ATTN: Dr. Lyndell Z. Hales, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, or call (601) 634-3207, FAX (601) 634-4253, Internet: l.hales@cerc.wes.army.mil

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